IN THE U.S. PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

Frank ARNDT et al.	Conf. 5638
Application No. 10/590,962	Group 2834
Filed August 29, 2006	Examiner D. ROSENAU

CLADDING COMPRISING AN INTEGRATED POLYMER ACTUATOR FOR THE DEFORMATION OF SAID CLADDING

APPEAL BRIEF

Assistant Commissioner for Patents
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March 23, 2009

MAY IT PLEASE YOUR HONORS:

(i) Real Party in Interest

The real party in interest in this appeal is the assignee, Siemens AG of Munich, Germany.

(ii) Related Appeals and Interferences

None.

(iii) Status of Claims

Claims 1 and 3-10 are pending and this appeal is taken from the final rejection of all of the pending claims.

(iv) **Status of Amendments**

No amendment was filed subsequent to the final rejection on appeal.

(v) **Summary of the Claimed Subject Matter**

The invention as recited in the independent claim 1 is a cladding that includes an elastic boundary layer which forms the surface of the cladding, and a polymer actuator which is integrated in the cladding for the deformation of the boundary layer (specification p. 1, lines 4-7). Figure 1 shows electrode layer 16a as an example of the recited elastic boundary layer and electrically active polymer layer 15 as the polymer actuator.

The cladding bears on a substrate via a bearing area which matches the surface area of the cladding in terms of magnitude, but with only subregions of the bearing area being fixed to the substrate (specification p. 2, lines 6-10).

When an electric field is applied to the electrically active polymer, its surface is deformed. One application of such claddings is to aircraft wings for disrupting ice buildup (specification, paragraph bridging pp. 2-3).

Claim 6, the other of the two independent claims on appeal, differs from claim 1 by reciting that the cladding bears against a substrate via a bearing area which matches the surface area of the cladding in terms of magnitude, with the cladding

being firmly connected to the substrate via the entire bearing area, and has at least one electrode layer that extends only over a subregion of the polymer actuator (specification p. 5, lines 1-5). See polymer layer 15 connected to the substrate 12 over the entire surface area, in the embodiment of Fig. 3, and the specification at page 9, lines 19-21; see also the honeycomb configuration of electrode 16a in Fig. 3, which thus extends over only a subregion of the polymer actuator 15.

(vi) Grounds of Rejection to be Reviewed on Appeal

1) Whether Claims 1, 3, 5, 6, 8, and 9 would have been obvious, within the meaning of 35 U.S.C. § 103(a) over LARDIERE (U.S. 4,982,121) in view of PEI (U.S. 2004/0263028);

2) Whether Claim 4 would have been obvious, within the meaning of 35 U.S.C. § 103(a) over LARDIERE in view of PEI and ZALALUTDINOV (U.S. 2006/0239635); and

3) Whether claims 7 and 10 would have been obvious, within the meaning of 35 U.S.C. § 103(a) over LARDIERE in view of PEI and KIHARA (U.S. 2002/0043901).

(vii) Argument

Claims 1, 3, 5, 6, 8, and 9

The final rejection contends that Figs. 5 and 6 of LARDIERE disclose the cladding of claim 1, with the sole

exception of the requirement that the actuator is a polymer actuator in the form of a membrane actuator. In particular, the final rejection contends that element 26 of LARDIERE is an elastic boundary layer, and that elements 13 and 14 are the actuator. Page 6 of the final rejection reveals that the attempted reading of claim 1 on LARDIERE is predicated upon regarding elements 14 and 31 as the surface to be clad, despite that both of these elements are previously identified by the final rejection as being a part of the actuation mechanism, and are identified by LARDIERE as being part of the cladding itself.

Of course, it is clear from LARDIERE that in reality the surface to be clad is the substrate marked “S” in the figures, as the reference confirms at col. 5, lines 61-65. Moreover, it is clear that the insulating layer 31 of LARDIERE completely covers the lower conductive strip 14, such that it is unclear why the final rejection considers both elements 14 and 31 as the surface to be clad, even when one attempts to take the final rejection on its own terms.

Ultimately, however, the final rejection’s attempt to read claim 1 on LARDIERE falls down with respect to the requirement set forth in that claim that only subregions of the bearing area of the cladding are fixed to the substrate. If we adopt the fiction of the final rejection that elements 13 and 29 are the cladding and elements 14 and 31 are the

substrate to be clad, it is apparent from Figs. 5 and 6 that the “cladding” is not fixed to the “substrate” at all. Instead, insulating layer 29 is sandwiched between first outer wall 26 and intermediate layer 28 (see Fig. 4 of LARDIERE). However, insulating layer 29 is not disclosed as being fixed to either layer 31 or conductive strip 14 anywhere, much less only in subregions of its bearing area. Likewise, the upper conductive layer 13 is encapsulated within the first outer wall 28 (see Fig. 4), and nowhere is disclosed to bear upon, much less be fixed to, either of elements 14 and 31 of LARDIERE.[1]

Instead, outer walls 26 and 27 of the LARDIERE cladding are interconnected to the intermediate layer 28, all made of the same low-melting thermoplastic material, by posts 34, 36 of that same material passing through openings 32, 33 formed in the insulating layers 29 and 31 of the reference, to

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[1] An exact understanding of what is disclosed by LARDIERE is frustrated by inconsistencies in the drawings of that reference. In particular, Fig. 4 shows conductors 13 and 14 surrounded on all sides by the thermoplastic layers 26 and 27, respectively, whereas Figs. 5 and 6 show conductors 13 and 14 contacting insulating layers 29 and 31, respectively. Furthermore, Fig. 2 shows that the line 5-5 along which the sectional views of Figs. 5 and 6 are taken intersects the insulating layers 29 and 31 but not the conductors 13 and 14 (there referenced by 16). Therefore, in Figs. 5 and 6, the conductors 13 and 14, if shown at al, should be shown only in broken outline to signify that in fact they reside behind the plane of the page; instead, they are shown in solid cross-hatch, which does not agree with Fig. 2. But whichever depiction of LARDIERE is taken to be accurate, claim 1 does not read upon it.

form an integrated cladding in which the conductive strips 13, 14 and insulating layers 29 and 31 are encapsulated. This structure simply bears no relationship to that set forth in claim 1, even if the metallic conductors 13, 14 of LARDIERE were to be replaced by electrically active polymer membranes as are said to be taught by PEI.

The obviousness rejection of claim 1 is therefore fatally flawed in that is relies upon a technically inaccurate reading of the primary reference, which is internally inconsistent with respect to that misreading, and which in any event fails to respond to the requirements of the claim.

As to claim 6, the final rejection adopts the same misreading of LARDIERE in support of the proposition that the reference also teaches the distinct structure of a cladding that is firmly connected to the substrate over its <u>entire</u> bearing area. Of course, it is fundamentally contradictory to contend that a cladding can at once be connected to a substrate at only subregions of its bearing area, as per claim 1, and then to contend that the same cladding is connected to a substrate over its entire bearing area, as per claim 6. From the above discussion, it is apparent that neither condition is met by the “cladding” and “substrate” of LARDIERE as identified in the final rejection; however, it follows *a fortiori* and as a matter of simple logic that both conditions

by definition cannot be met by same disclosed structure of the reference.

The final rejection displays no awareness that its positions as to the independent claims 1 and 6 are contradictory, and reveals no inclination as to which claim it considers is more likely met by the reference. As discussed above regarding claim 1, in fact what the final rejection identifies as the cladding is not fixed to what it identifies as the substrate at all, and therefore neither claim reads upon the reference in this respect.

Hence, even if a skilled artisan had replaced the metallic conductors 13, 14 of LARDIERE with a polymer actuator as is said to be taught by PEI, the invention as recited in claim 6 would not be produced.

Claim 4

ZALALUTDINOV was relied upon as disclosing a piezoelectric element in which a through-hole is provided in the cladding. However, ZALALUTDINOV fails to discusse the above-discussed features missing from LARDIERE and PEI.

Thus, ZALALUTDINOV fails to remedy the above-noted deficiencies of LARDIERE and PEI.

Claims 7 and 10

Similar to ZALALUTDINOV, KIHARA was relied upon as disclosing a piezoelectric element in which the electrode is in the form of honey-comb-like web structures. However, KIHARA also fails to discuss the above-discussed features missing from LARDIERE and PEI.

Thus, KIHARA fails to remedy the above-noted deficiencies of LARDIERE and PEI.

Conclusion

From the above discussion it is believed to be apparent that the rejections on appeal are in error and should be reversed. Such action is therefore respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any

additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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(viii) Claims Appendix

1. A cladding comprising:

an elastic boundary layer which forms the surface of the cladding, and

a polymer actuator in the form of a membrane actuator which forms the cladding for the deformation of the boundary layer,

wherein the cladding bears on a substrate by means of a bearing area which matches the surface area of the cladding in terms of magnitude, with only subregions of the bearing area being fixed to the substrate.

3. The cladding as claimed in claim 1, wherein the cladding is fixed to the substrate at regular intervals in a punctiform manner.

4. The cladding as claimed in claim 1, wherein the cladding is provided with through-holes.

5. The cladding as claimed in claim 1, wherein said cladding is composed of individual lamellae which are each fixed to the substrate by means of one end, with the lamellae each being polymer actuators in the form of bending actuators.

6. A cladding comprising:

an elastic boundary layer which forms the surface of the cladding, and

a polymer actuator in the form of a membrane actuator which forms the cladding for the deformation of the boundary layer,

wherein the cladding bears against a substrate by means of a bearing area which matches the surface area of the cladding in terms of magnitude, with the cladding being firmly connected to the substrate by means of the entire bearing area and having at least one electrode layer for the polymer actuator, which electrode layer extends only over a subregion of the polymer actuator.

7. The cladding as claimed in claim 6, wherein the electrode layer forms the webs of a honeycomb-like structure on the polymer layer.

8. The cladding as claimed in claim 6, wherein the substrate forms an electrode for a polymer layer of the polymer actuator.

9. The cladding as claimed in claim 1, wherein the boundary layer is in the form of an auxiliary layer on the polymer actuator.

10. The cladding as claimed in claim 7, wherein the substrate forms an electrode for a polymer layer of the polymer actuator.

(ix) Evidence Appendix

None.

(x) Related Proceedings Appendix

None.